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A time-of-flight type near backscattering spectrometer DNA in J-PARC

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A time-of-flight (TOF) type near-backscattering spectrometer (n-BSS), DNA was built and started operation in 2012 at the Materials and Life Science Experimental Facility (MLF) of the Japan Proton Accelerator Research Complex (J-PARC). DNA is a unique instrument among spallation pulsed neutron facilities over the world in terms of n-BSS equipped with a high-speed pulse-shaping disc-chopper. Neutron beam from the coupled moderator which provides most intense but broadest pulse among all three moderators in MLF is handled flexibly in pulse width by this chopper with keeping intensity and making symmetrical pulse in a TOF spectrum. Si crystal analyzers with back-coated by neutron absorber extremely reduces unfavorable background scattering of the instrument so as to reach signal-to-noise ratio of ~100,000. Those factors gave big advantage to enlarge application fields to dynamical behaviors of atoms and spins in bio-molecules, soft-materials and strongly-correlated electron system in nanosecond timescale or in micro-eV energy region.

Primary author: Dr SHIBATA, Kaoru (Materials and Life Science Division, J-PARC Center, Japan Atomic Energy Agency (JAEA))

Co-authors: Dr MATSUURA, Masato (Neutron R&D Division, CROSS-Tokai); Dr TAKAHASHI, Nobuaki (Institute for Chemical Research, Kyoto University); Dr TOMINAGA, Taiki (Neutron R&D Division, CROSS-Tokai); Dr YAMADA, Takeshi (Neutron R&D Division, CROSS-Tokai); Dr KAWAKITA, Yukinobu (Materials and Life Science Division, J-PARC Center, JAEA)

Presenter: Dr SHIBATA, Kaoru (Materials and Life Science Division, J-PARC Center, Japan Atomic Energy Agency (JAEA))

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